

### REMARKS

Reconsideration is respectfully requested. Upon entry of this amendment Claims 1, 3, 4, 6, 10, 12, and 14-15 are pending. Claim 1 has been amended to more particularly point out and distinctively claim subject matter of the invention. Support for the amendment is found in the specification, for example in original claim 11. Claim 11 is cancelled.

With respect to all amendments and cancelled claims, Applicant has not dedicated or abandoned any unclaimed subject matter. Applicant reserves the right to pursue prosecution of any presently excluded claim embodiments in future continuation and/or divisional applications.

Claims 1, 3-4, 6, 8, 10-12, and 14-15 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Callegari et al. (U.S. Patent No. 6,664,186) ("*Callegari*") in view of Buchanan (U.S. Patent No. 6,984,591) ("*Buchanan*"). Applicant respectfully traverses.

When rejecting claims under 35 U.S.C. §103(a), the Examiner bears the burden of establishing a *prima facie* case of obviousness. See, e.g., *In re Bell* 26 USPQ2d 1529 (Fed. Cir. 1993); M.P.E.P. §2142.

1. *Callegari and Buchanan Do Not Teach or Suggest Applicant's Amended Claims*

Applicant respectfully submits that *Callegari* and *Buchanan*, either alone or in combination, do not teach or reasonably suggest each limitation of Applicant's amended claims.

*Callegari* fails to disclose or suggest a metal silicate layer having more than one metal element. Applicant respectfully submits that *Buchanan* does not rectify this deficiency. At col. 24, lines 38 to 50, *Buchanan* states:

In FIG. 5, a silicon substrate 50 with a clean (no native SiO<sub>2</sub>) surface is the starting point. In FIG. 6, a lower layer 55 has been formed by oxidation/nitridation of silicon substrate 50 to form a SiO<sub>x</sub>N<sub>y</sub> layer. In FIG. 6, a middle layer 56 of zirconium oxide has been formed by the inventive method, comprised of utilizing a precursor source mixture of zirconium t-butoxide and

hexane, vaporizing the precursor source mixture at 80 C, and deposition of a  $ZrO_2$  film in the presence of an oxidant such as oxygen, ozone,  $N_2O$ ,  $H_2O$  or mixtures thereof at 400 °C on the  $SiO_xN_y$  layer in a chemical vapor deposition reactor. In FIG. 7, upper layer 57 is formed by plasma nitridation of the  $ZrO_2$  surface.

The formation of the lower layer 55 in *Buchanan* is made by traditional methods and is preferably comprised of a  $SiO_xN_y$  layer, and is not considered part of the inventive method by *Buchanan*. Also, at col. 24, lines 7 – 11, *Buchanan* states:

A suitable lower layer 55 is composed of dielectric materials including, but not limited to:  $SiO_2$ ,  $SiO_xN_y$ ,  $Si_3N_4$ , prepared from oxidation or nitridation of the silicon substrate or deposited separately. Other suitable lower layer materials include metal oxides or metal silicates.

*Buchanan* does briefly mention that the lower layer can be a metal silicate, however *Buchanan* does not teach a metal silicate layer having more than one metal element. In fact, Applicant respectfully submits that *Buchanan* teaches away from the claimed invention. Specifically, *Buchanan* teaches that the lower layer is comprised of dielectric materials prepared from oxidation or nitridation of the silicon substrate, or is deposited separately. Thus, the lower layer is formed by oxidizing or nitriding the substrate (a process completely distinct from deposition), or by separate deposition. Neither of these techniques are capable of forming a layer forming a metal silicate layer on the surface of the substrate, wherein said metal silicate layer includes more than one metal element, as recited in Applicant's amended claims.

2. It is Improper to Combine Callegari and Buchanan

It is improper to combine references where the references teach away from their combination. In *re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). This is because “when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious.” *KSR International Co. v. Teleflex Inc.* 550 U.S. \_\_\_\_ at 12 (S. Ct. 2007). If the proposed modification or combination of

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the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). Furthermore, to establish a *prima facie* case, there must be a reasonable expectation of success. M.P.E.P. §2142.

*Callegari* is directed to method of fabricating aluminum oxide films. It disclose a “aluminum oxide film is formed by ... depositing an aluminum oxide film: on [sic] the substrate at a temperature greater than 500°C.” Abstract. To that end, it discloses a method

to form a vaporized precursor, and depositing a constituent of the vaporized precursor on a substrate to form a film at a deposition temperature of greater than 500° C. More particularly, the deposition is carried out at a temperature of from about 500° to about 1200°C.

Col. 4, lines 47-51.

Although *Callegari* states that the deposition can be carried at temperature lower than 500°C (“Aluminum oxide was deposited at 350-700°C., preferably at temperatures of greater than 500°C”), col. 6, lines 35-37, it immediately provides both empirical data and theoretical explanation for why the deposition should be carried at a temperature higher than 500°C. Specifically, *Callegari* discloses:

[It is believed that the aluminum oxide deposited at temperatures less than 500°C. [sic] which contain significant quantities of OH and/or absorbed water as observed in the FTIR spectra are less dense, contain an excess of oxygen and more readily allow the diffusion of oxygen through the film facilitating the formation of an interfacial oxide layer during post deposition annealing. See Col. 7, lines 2-8.

In contrast, *Buchanan* discloses that “an Al<sub>2</sub>O<sub>3</sub> film is deposited at 200°C.” Col. 23, lines 21-22.

Therefore, *Callegari* and *Buchanan* disclose methods of depositing aluminum oxide films under totally different condition: *Buchanan* discloses a deposition process at 200°C; *Callegari* discloses that the deposition should NOT be carried out at 200°C, but greater than 500°C. Thus

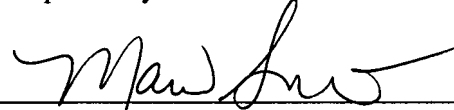
the proposed combination will change the operating principle of either *Callegari* or *Buchanan*. In fact, the two references teach away from each other. As such, it is improper to combine them.

Further, even assume *arguendo* that *Callegari* and *Buchanan* can be combined, there is still no expectation of success because the operating temperatures of two methods of depositing aluminum oxide films are mutual exclusive.

For the forgoing reasons, Applicant respectfully submits that a prima facie case of obviousness has not been made. As such, the rejection is improper and should be withdrawn.

Applicant respectfully submits that the application is in condition for allowance. If any matters can be resolved by telephone, the Examiner is invited to call the undersigned attorney at the telephone number listed below.

Respectfully submitted,



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under 37 C.F.R. §1.34

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